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Notice of Allowability	Application No.	Applicant(s)	
	10/619,197	GOLLA ET AL.	
	Examiner	Art Unit	
	Albert K Wong	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 11/8/2003.
2. ☒ The allowed claim(s) is/are 1,3-13,15-39,42-47 and 53-56.
3. ☒ The drawings filed on 14 July 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>11/8/2004</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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1. This Office action is in response to applicant's response to the amendment filed November 8, 2004 and subsequent interview on January 7, 2005. Claims 1-47 and 53-56 are pending. Claims 48-52 have been cancelled and the specification has been amended as requested.

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mark E. Scott on January 7, 2005.

The application has been amended as follows:

Please cancel claims 2, 14, and 40-41.

1. (Currently Amended) A method comprising:
sending a first datum of a first parameter in uncompressed form from a downhole unit within a drill string to a surface unit; and
sending a second datum of the first parameter in compressed form from the downhole unit within the drill string to the surface unit by sending a first delta value being a difference between the first and second datum; and
reconstructing the second datum from the first datum and the first delta value.
3. (Currently Amended) The method as defined in claim 1 further comprising:
sending a second delta value, being a difference between the second datum and a third datum of the first parameter; and
reconstructing the third datum from the first datum, the first delta value and the second delta value.

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4. (Currently Amended) The method as defined in claim 1 further comprising:
sending a second delta value, being a difference between the first datum and a third
datum of the first parameter; and
reconstructing the third datum from the first datum and the second delta value..
5. (Currently Amended) The method as defined in claim 1 wherein sending the first delta
value further comprises encoding a most likely value of the first delta value as a zero.
7. (Currently Amended) The method as defined in claim 1 further comprising, prior to
calculating the first delta value, smoothing raw data of the first parameter.
9. (Currently Amended) The method as defined in claim 1 further comprising selecting a
number of bits to use to encode the first delta value based on the size of the first delta value.
13. (Currently Amended) A drill string assembly comprising:
a downhole tool designed to generate a first datum and a second datum being one of
drilling parameters, borehole parameters or formation properties;
a communication system coupled to the downhole tool, the communication system
adapted to communicate to a surface device; and
wherein the communication system is adapted to send the first datum to the surface
device in uncompressed form, and wherein the communication system is further
adapted to send the second datum to the surface device in a compressed form as a
difference between the first and second datum.
15. (Currently Amended) The drill string as defined in claim 13 wherein the communication
system encodes a most likely value of the first delta value as a zero.
17. (Currently Amended) The drill string as defined in claim 13 wherein the communication
system smoothes data of the first parameter prior to sending the data.

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19. (Currently Amended) A method comprising:
sending a first list from a downhole device within a drill string to a surface unit, the first list comprising a first value, in uncompressed form, of a downhole parameter; and
sending a second list through the downhole device within a drill string to the surface unit, the second list comprising a second value, in compressed form, of the downhole parameter, the second value related to the first value.
33. (Currently Amended) A method comprising:
sending an first list from a downhole unit within a drill string to a surface computer, the first list comprising a first datum in uncompressed form and a second datum in uncompressed form; and
sending a second list from the downhole unit within the drill string to the surface computer, the second list comprising third datum related to the first datum and a fourth datum related to the second datum, and wherein at least one of the third and fourth datum is in a compressed format.
34. (Currently Amended) The method as defined in claim 33 wherein sending the second list further comprises sending both the third and fourth datums in compressed format.
37. (Currently Amended) The method as defined in claim 33 wherein the first list precedes the second list.
38. (Currently Amended) The method as defined in claim 33 wherein the second list precedes the first list.
39. (Currently Amended) A method comprising:
sending a first list from a downhole device within a drill string to a surface computer, the first list containing an uncompressed value of the downhole parameter list, and at least one compressed value of the downhole parameter; and

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calculating the compressed value of the downhole parameter as the difference between the uncompressed value and a value of a datum to be compressed.

3. Claims 1, 3-13, 15-39, 42-47, and 53-56 are allowed.
4. The following is an examiner's statement of reasons for allowance: The concept of compressing transmitted data within a borehole environment is taught by Gardner 6,580,751. The prior art, however, fails to teach or suggest the particular form of data compression as recited in the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert K Wong whose telephone number is 571-272-3057. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on 703-305-4704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Albert K. Wong
January 10, 2005